

Title: Integrated Methodologies for the digitisation and management of Architectural Heritage

Abstract

The conservation and management of architectural heritage is a highly relevant and timely issue, underscoring the need to develop specific protocols for the systematization, analysis, and management of related information. Indeed, critical issues such as the huge amounts of data, fragmentation, and interoperability of information are crucial factors in the strategies for managing and preserving historical heritage at both urban and building scales. In this context, the cognitive and preservation process of the architectural heritage represent key aspects through which suitable recovery interventions can be defined. Therefore, it is crucial to link the semantic richness and geometric complexity of the existing built environment to the various parameters that characterise architectural heritage, using appropriate methods of representation and systematisation.

The lesson will provide an overview of the potential offered by new digital systems and models, both from a procedural and methodological perspective, as well as in relation to the use and integration of the latest tools for the acquisition and digitisation of the real environment.

Thus, the lesson aims to introduce the systematisation of existing technical knowledge and to identify operational and methodological workflows designed to bridge gaps and streamline cumbersome procedures through the use of parametric and virtual digital models.

The lecture will delve into the following research topics, with specific application to pilot cases:

- Identification of parameters for the qualification of historic architectural heritage.
- Review, critical analysis, and evaluation of existing ontologies and glossaries in relation to the identified parameters and relationships.
- Semantic and conceptual structuring to connect cognitive information with the digital model.
- Analysis, identification, and evaluation of decision-support information systems within the conservation process of existing architectural heritage.
- Development of rapid systems for the acquisition and analysis of architectural heritage, employing Virtual Reality and Machine Learning techniques.
- Evaluation of the integration of standardised digital models (CityGML-based models) with digital information systems through Virtual Reality techniques.